

From the  
INTERNATIONAL SEARCHING AUTHORITY

PCT

To:

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WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY  
(PCT Rule 43bis.1)

Date of mailing  
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference  
see form PCT/ISA/220

**FOR FURTHER ACTION**  
See paragraph 2 below

International application No.  
PCT/NL2005/000041

International filing date (day/month/year)  
20.01.2005

Priority date (day/month/year)  
20.01.2004

International Patent Classification (IPC) or both national classification and IPC  
H01M8/06, C25B15/00, H01M8/04

Applicant  
NEDSTACK HOLDING B.V.

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☒ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA:



European Patent Office  
D-80298 Munich  
Tel. +49 89 2399 - 0 Tx: 523656 epmu d  
Fax: +49 89 2399 - 4465

Authorized Officer

Götz, H

Telephone No. +49 89 2399-6928



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**Box No. I Basis of the opinion**

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1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
  - ☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
  - a. type of material:
    - ☐ a sequence listing
    - ☐ table(s) related to the sequence listing
  - b. format of material:
    - ☐ in written format
    - ☐ in computer readable form
  - c. time of filing/furnishing:
    - ☐ contained in the international application as filed.
    - ☐ filed together with the international application in computer readable form.
    - ☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

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**Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

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**1. Statement**

Novelty (N)	Yes: Claims	
	No: Claims	1-9
Inventive step (IS)	Yes: Claims	
	No: Claims	1-9
Industrial applicability (IA)	Yes: Claims	1-9
	No: Claims	

**2. Citations and explanations**

**see separate sheet**

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**Box No. VIII Certain observations on the international application**

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The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

**see separate sheet**

**Re Item V.**

**1. Reference is made to the following document:**

D1: US-A-4 310 605 (EARLY ET AL) 12 January 1982 (1982-01-12)

D2: WO 99/56334 A (DE NORA S.P.A; FAITA, GIUSEPPE; OTTAVIANI, ANGELO) 4  
November 1999 (1999-11-04)

**2. Summary**

The present invention discloses an electrical power plant based on fuel cells with the maximum power output being two times higher than the average generated power.

**3. Novelty, Article 33(2) PCT**

3.1 Document D1 relates to a fuel cell system comprising fuel cell modules including a plurality of sub-stacks of fuel cells. The fuel cells of the sub-stack are connected in series (column 1, line 17-68).

D1 solves the problem of supplying power to direct current loads without applying voltage regulators (column 1, line 13-16).

The sub-stacks may be connected in parallel so that the fuel cell module provides a voltage out put corresponding to the voltage of the sub-stack. The magnitude of the current depends on the current of each sub-stack and the number of sub-stacks connected in parallel (figure 3; column 5, line 63 - column 6, line 13).

In order to provide a voltage regulation function, a plurality of said modules are electrically connected in series and switching means are provided for connecting a preselected number of said modules to the power output terminals of the fuel cell system (figure 6; column 6, line 14-57). A more complicated switching arrangement may be provided where all sections of the fuel cell always share the load. Thus, the maximum power output may be several times higher than the average generated power.

The fuel cell system may be used in combination with an electrolytic cell system, for example electrolytic refining cells, having operating voltage and current demand

characteristics matched by the operating voltage and current output characteristics of the fuel cell system. The switching means function provide stepwise voltage control for use in matching the incremental voltage requirements of the electrolytic cells and does not require any voltage conditioning or regulating means (figure 7, 8; column 6, line 46 - column 8, line 36).

In another arrangement, sub-stacks may be electrically connected in series and switching means provided for connecting a pre-selected number of sub-stacks to the power output terminals of the fuel cell module (column 8, line 37 - column 9, line 14; figure 9). The current of the module corresponds to the current of the sub-stack.

The number of fuel cells in the fuel cell system is higher than 100 (column 2, line 44-46; column 5, line 63 - column 6, line 13).

Consequently, claims 1, 2, 5, 6 are not novel with regard to D1.

3.2 Document D2 discloses a method for the direct connection of fuel cells to electrolyzers of electrochemical plants producing hydrogen as a by-product.

D2 solves the problem of providing a method for the integration of fuel cells in electrochemical plants, for example chlor-alkali plants, chlorate electrolysis or hydrochloric acid plants without interposition of a voltage converter (page 3).

D2 discloses a fuel cell system comprising several modules each comprising stacks and each of the stacks comprising fuel cells. The stacks may be connected in series or in parallel and the modules may be connected in series or in parallel with the electrolyzer (page 5). An example is given with the stacks of the modules being connected in series and the modules themselves being connected in parallel with the electrolyzer (page 6; figure 4; figure 5). The voltage of the fuel cell system can be adjusted to that of the electrolyser by sequentially inserting modules (claim 6; page 6, 7).

Thus, D2 destroys the novelty of claims 1-9.

3.3 Every car comprising fuel cells as an electric power supply is novelty destroying for independent claim 1, as generally a car is not running the whole day and thus the average generated power of the fuel cells is much lower than the maximum power. Moreover, if fuel cells are applied to drive a car, more than hundred fuel cells are necessary and they will remain in the car until the end of their life time. Consequently, claims 2 and 5 are also not novel.

#### **4. Industrial applicability, Article 33(4) PCT**

4.1 The invention finds industrial use in the field of fuel cells and therefore complies with the requirements of Article 33(4) PCT.

**Re Item VIII.**

##### **1. Clarity, Article 6 PCT**

1.1 Independent claim 1 does not meet the requirements of Article 6 PCT in that the matter for which protection is sought is not clearly defined. The claim attempts to define the subject-matter in terms of the result to be achieved which merely amounts to a statement of the underlying problem, without providing the technical features necessary for achieving this result.

1.2 Moreover, the subject-matter of independent claim 1 relates to a *method* how to operate an assembly of fuel cell stacks and does not define the assembly of fuel cell stacks in terms of its technical features.

1.3 Independent claim 1 is not clear, as it is not defined what *kind of average* generated power is meant, for example if it is an average over time.